

AMENDMENTS IN THE CLAIMS

1-44. (CANCELLED).

45. (NEW) A light scrambling system comprising:

- a substrate with a surface; and
- a plurality of light pipes, each having a first end on the surface of the substrate and second end on the surface of the substrate, and each adapted to receive a light input at the first end and to transmit the light output at the second end;
- wherein the first ends of the light pipes have a first spatial relationship to one another, wherein the second ends of the light pipes have a second spatial relationship to one another, and wherein the first spatial relationship is different from the second spatial relationship thereby scrambling the light received by the first ends of the light pipes and transmitted by the second ends of the light pipes.

46. (NEW) The light scrambling system of claim 45 wherein each of the plurality of light pipes is unbranched and continuous such that there is a 1:1 ratio of first ends and second ends.

47. (NEW) The light scrambling system of claim 45 wherein the substrate has multiple sides, wherein each of the sides defines a surface area, wherein the surface is one the two sides with the largest surface area.

48. (NEW) The light scrambling system of claim 45 wherein the light pipes are adapted to operate in the following modes:

- an interference mode, wherein the first end is substantially blocked from receiving light into the light pipe and the blockage is detectable at the second end as a shadow; and
- a normal mode, wherein the first end is not blocked from receiving light into the light pipe and the light pipe transmits light from the first end, through the substrate, to the second end.

49. (NEW) The light scrambling system of claim 45 wherein the light pipes have a rectangular cross section.

50. (NEW) The light scrambling system of claim 45 wherein the light pipes are u-shaped.

51. (NEW) The light scrambling system of claim 45 wherein the first end and the second end are flush to the surface of the substrate.

52. (NEW) The light scrambling system of claim 45 wherein the light pipes are embedded in the substrate.

53. (NEW) The light scrambling system of claim 52 wherein the substrate is a first material and the light pipes are a second material that is different from the first material.
54. (NEW) The light scrambling system of claim 53 wherein the substrate has a lower refractive index than the light pipes.
55. (NEW) The light scrambling system of claim 53 wherein the substrate is opaque.
56. (NEW) The light scrambling system of claim 53 wherein the substrate is translucent.
57. (NEW) The light scrambling system of claim 53 wherein the substrate is selected from the group consisting of concrete, plastic, silicones, thermoplastics, thermosets, ceramics, fiber reinforced plastics, thermoplastic composites, thermoset composites, ceramic matrix composites, organic matrix composites, and combinations thereof.
58. (NEW) The light scrambling system of claim 45 wherein the substrate is comprised of a plurality of sections coupled together and at least one section contains at least one light pipe.
59. (NEW) The light scrambling system of claim 58 wherein the substrate is transparent.

60. (NEW) The light scrambling system of claim 58 wherein the substrate is selected from the group consisting of plastic, silicones, thermoplastics, thermosets, ceramics, fiber reinforced plastics, thermoplastic composites, thermoset composites, ceramic matrix composites, organic matrix composites, and combinations thereof.
61. (NEW) The light scrambling system of claim 58 wherein a first light pipe is defined by at least one first cut in the section and wherein the at least one first cut forms a refractive index boundary.
62. (NEW) The light scrambling system of claim 61 wherein a second light pipe is defined by at least one second cut in the same section and wherein the first light pipe at least partially surrounds the second light pipe.
63. (NEW) The light scrambling system of claim 62 wherein a third light pipe is defined by at least one third cut in the section and wherein the second light pipe at least partially surrounds the third light pipe.
64. (NEW) The light scrambling system of claim 63 wherein the at least first cut does not extend the entire length of the first light pipe, thereby forming a connection point that holds the light pipes of the section together and provides physical strength to the substrate.